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Our Future Rests on Soil Fertility

America has grown strong largely because her people have eaten well. Eating well means living well, working well. Those are facts that some of us may overlook. A thriving agricultural-industrial system has put meat and potatoes on our tables, white shirts on our backs, soft rugs on our living room floors.

Such necessities, and niceties, come largely from the soil. A lot of us need to think of that. We need to remember that a biscuit in the hand is just so much protein and starch and fat taken out of the soil; that much of our clothing grows on cotton stalks; that sheep are only walking factories, eating weeds and grasses and grains to grow wool on their bodies; that such a flimsy thing as a paper napkin represents a mite of soil resource taken away from our national stockpile of natural resources.

If we will look upon our day-to-day living in this light, we will understand why a nation growing toward a hundred and seventy million persons makes a terrific drain upon soil resources. We will realize why it is necessary for us to maintain the soil, even while using it.

Modern farm equipment makes the application of soil conservation practices both possible and profitable. It helps to put "a future in soil fertility."

THE AGRARIAN

Volume XVI | The Clemson Agricultural College | Number 3

IN THIS ISSUE

THE COVER: The silhouette of a student using a microscope— a familiar scene in all departments of the School of Agriculture. (Photo by Wright)

OUR THANKS to Mr. L. W. Riley and his staff for their help on photography.

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AGRARIAN PHILOSOPHY

By Carol Brown

This issue of the Agrarian features the School of Agriculture at Clemson. Its purpose is to show the excellent opportunities offered by the field of agriculture and how one may take advantage of these opportunities at Clemson.

Everywhere we look around us we can see that many changes have taken place and certainly the field of agriculture has had its share. Agriculture actually began many thousand years ago when man settled in small groups and began to raise a few plants and animals. His animals were those he could domesticate and his plants were growing wild. From this humble beginning agriculture has become one of the most important scientific fields. One who chooses an agricultural field will find that he will study such things as chemistry, physics, genetics, botany, pathology, math, statistics, and even the atomic theory. Agriculture is now and will remain a highly specialized field.

A special item of interest is that there is no need to have a farm waiting back home to make the study of agriculture worthwhile. Statistics for 1950 show that of all agricultural workers only 11.9% are actually working on the farm. Thus those who do not have farms of their own can also find a secure future in agriculture.

All this can add up to only one thing; agriculture is an interesting and challenging field of work which offers many opportunities and a secure future to anyone who is interested. I am glad that I have invested my future in agriculture.

The Agrarian wishes to express it thanks to everyone who assisted in publishing this issue. It takes a lot of time to put out a magazine and time is especially valuable to the student who never seems to have enough of it.

Since the next issue will be published by next year's incoming staff this will be the last issue that many of us will be working on. It feels strange to know that school life is over and now we have the whole world to face instead of the face of a friendly professor. However, we have no regrets because although we have worked hard and the hours have been long its been fun.

Careers in Agriculture

by Dr. J. W. Jones
Director of Agricultural Teaching

Agriculture is a science, a business, an industry! Not many people realize that agriculture provides more jobs in the city than on the farm . . . more jobs and careers than any other industry.

To achieve maximum success in any type of work, a person must sight his target and aim carefully. But agriculture offers a broad target. If agriculture is chosen, it is hard to miss!

Many people feel they know all about agriculture. If they live on the farm, they know agriculture as the farmer knows it. If they live in a city, agriculture probably means fruits and vegetables at the grocery store or exhibits at the county fair. Agriculture is much more than that. It is the basic industry of the nation!

There are more than 500 types of occupations in the eight major areas of employment for college agricultural graduates. Recent studies show

Dr. J. W. Jones

that the eight areas would employ 15,000 new graduates each year. At the present time our land-grant colleges, such as Clemson, are graduating about 8,000 each year in agricultural sciences . . . 8,000 trained persons to fill 15,000 jobs, or about two futures for every graduate.

Some of the careers in each of the eight areas of employment are given below:

Research—work with the Agricultural Experiment Stations, the United States Department of Agriculture and other agencies in the fields of farm production, processing, marketing, and agricultural engineering. **Education** — teaching agriculture in high schools and colleges, positions with the Agricultural Extension services, and farm organizations. **Industry** — employment related to meat and poultry packing, farm machinery, fertilizers and lime, pesticides and herbicides, dairying processing, food and seed processing, and feed manufacturing. **Business** — banking and credit, insurance, farm management, land appraisal, marketing, storage and warehousing, transportation, and private businesses. **Communications** — work with newspapers, magazines, publications, radio and television. **Conservation**— jobs related to the conservation of soil, water, forests, fish, and wildlife. **Agricultural Services** — public services with the United States Department of Agriculture and state departments of agriculture, and private services, such as veterinarians and agricultural consultants. **Farming** — both general and specialized farm production, the most important job of all in agriculture.

Good jobs are available to graduates in many fields. An individual must make a choice! He must weigh the facts and compare the career opportunities in agriculture with those in other fields. People with city backgrounds can also succeed in many agricultural careers. Many employers hire young people with training in agriculture but not necessarily with farm backgrounds. In some colleges, the enrollment in agriculture of city boys and girls is as high as 65 percent. Boys and girls reared on a farm have a running start on a successful agricultural career. They already know a lot about farm terms and farm problems. They also know how the farmers depend upon agriculturally trained people in other fields.

Most young people are also interested in dollars when they consider their future. Surveys indicate that a college graduate can expect to earn, in his lifetime, $72,000 more than the average high school graduate. This is a cash return of 18 times an investment of $4,000 in college. College agricultural graduates are now receiving good salaries, too.

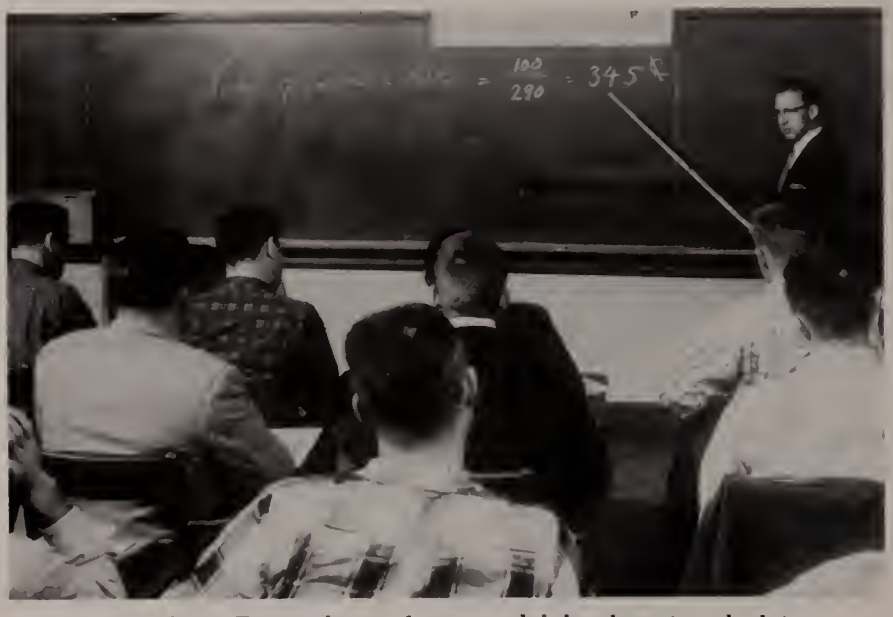
The School of Agriculture at Clemson offers college training leading to employment in the numerous occupations available to agricultural graduates. Four-year courses of study are available in Agricultural Economics, Agronomy, Animal Husbandry, Dairying, Entomology, Horticulture, Poultry, Vocational Agricultural Education, and Agricultural Engineering. The curriculum in Agricultural Engineering is jointly administered by the School of Agriculture and the School of Engineering. In addition to the four-year curricula, two-year courses of study are offered in Pre-Veterinary Medicine and Pre-Forestry. When sufficient funds become available, the forestry curriculum will be changed to a four-year course leading to a Bachelor's degree.

Clemson College has a well qualified agricultural faculty and excellent physical facilities for training young people in agriculture. The college grounds comprise 30,000 acres, including the campus, the farms, and the Experiment Station grounds. At a cost of $3,500,000, the college recently completed two agricultural buildings and a number of greenhouses.

Further information concerning fields of study and career opportunities in agriculture may be obtained by writing to the School of Agriculture, Clemson Agricultural College, Clemson, South Carolina.

Agricultural Economics and Rural Sociology

W. B. Pressley, Jr., Ag. Ec. 1957



Agriculture Economics professor explaining how to calculate the value of the dollar.

Marketing

Management

Rural Life

The curriculum in Agricultural Economics and Rural Sociology is designed to teach students the application of economic and business principles to the problems of agriculture and of agricultural industries, and to help them to fill their places in the economic and social life of the state and nation.

Ths **Agricultural Economics Department** at Clemson is similar in many respects to the business administration departments or schools in the Universities. Here, however, the examples are drawn from the business of agriculture and rural life rather than from non-agricultural industries and urban society. In addition to offering a degree in Agricultural Economics the department does service work for other departments by offering courses in such subjects as statistics, taxation, conservation, rural sociology, community organization, etc. Many students from other departments in the School of Agriculture and from other schools in the college elect courses within the **Department of Agricultural Economics.** In turn, students majoring in Agricultural Economics may take a wide variety of courses in other Departments.

In addition to the teaching activities of the department, a broad program of research and extension is constantly being conducted by the department staff.

A student who wishes to major in Agricultural Economics will take the same two-year basic curriculum as all other agricultural majors except that he may elect to substitute a math course for a chemistry course. Among the courses required of juniors and seniors majoring in Agricultural Economics, and elected by many students in other departments, are the following with a brief description of each:

Farm Management, which involves the study of the business principles underlying the organization and operation of the entire farm. Other factors such as proper balance between farm enterprises and the use of sound economic principles are considered from the viewpoint of continuous profit.

Farm Accounting, which is designed to acquaint the student with the double-entry system of bookkeeping and also to bring to his attention the alvantage and necessity of keeping accurate records. A knowledge of accounting, incidentally, is essential to almost any business activity.

Public Finance, which includes the principles of financing government,

sources of public revenues, objects of public expenditures, and problems of fiscal administration. This course provides principles and facts which are beneficial to a citizen regardless of his occupation.

The courses in **Marketing** offer (1) a general survey of the field of marketing and (2) provide opportunity for detailed analysis and study of marketing agencies, functions, channels, methods, and institutions.

A relatively new but very imporant course recently added to the Agricultural Economics curriculum is titled **Economics of Conservation.** This course is concerned with a study of the principles and problems involved in the conservation and use of soil, water, minerals and the other natural resources.

In addition to the above courses, courses in **Statistics, Prices, Agricultural Policy, Cooperative Marketing** and several courses in the field of **Rural Sociology** are offered at the undergraduate level.

These and the many other courses required in the **Agricultural Economics curriculum** qualify a person for a very broad field of work. For example, the graduate in Agricultural Economics has sufficient working knowledge of marketing activities to qualify him for positions in agriculture and industry where marketing is involved. With his training in farm management and agricultural finance he is prepared for a career in the agricultural loan department of a commercial bank or of a government lending agency. Or, he may prefer to go into the extension service as assistant county agent or extension specialist. Or the Agricultural Economics graduate may want to go into farming either as owner or manager. In addition, his training fits him for promotion and sales work with most commercial concerns and especially with those involved in fields related to agriculture. The broad curriculum, embracing the principles of economics and business, and made available to all Agricultural Economics majors, qualifies them for operating numerous enterprises where knowledge of economic principles is an essential supplement to knowledge of the technical requirements of the business. Then, with some additional training, they are qualified to do teaching or research work in a College such as Clemson.

The Agricultural Economics Department was first organized at Clemson in 1926. Prior to that time the only course offered in this field was farm management which was taught in the Agronomy Department. In 1946 a program of graduate study was initiated in the Department. Since that time 30 men have received Master of Science degrees in the Department. In a comparatively short space of time these men have established themselves in positions of high rank.

A recent survey conducted by the **Agricultural Economics Department** reveals something of the accomplishments and occupations of the more than 200 men who have graduated with a major in the Department since the first class in 1930. Analysis of the replies indicates that about 60 percent of the graduates in Agricultural Economics are employed in South Carolina. (It is interesting to note at this point that this is an exception to what seems to be the rule, for it is generally thought that over half of the graduates of South Carolina colleges leave the state to work in higher-paying areas.) Of the total graduates 14 percent are employed in the adjoining states of Georgia and North Carolina. Sixteen percent of the graduates are employed in other Southeastern states and the remaining 10 percent are engaged in work in areas other than the South.

Based on replies to the questionnaire it appears that about one-third of the Agricultural Economic graduates are employed directly in professional Agricultural Economics work such as: (1) research work in Experiment Stations and with the United States Department of Agriculture; (2) teaching in Land Grant Colleges such as Clemson, other colleges and high schools, and (3) work with the Agricultural Extension Services. Approximately 15 percent are engaged in sales and promotional work and about 8 percent are operating their own private business or are in business partnerships. About 15 percent of the graduates are engaged in farming and related activities. The remainder are employed in miscellaneous occupations as ministers, news editors, lawyers, bankers, optometrists, personnel managers, etc.

The successful employment of Agricultural Economics graduates in a wide variety of agricultural and related occupations reflects the utility and versality of this curriculum of basic training. Many diversified job opportunities are enjoyed by graduates in Agricultural Economics because of the well-planned and efficiently-administered course offered by the Department at Clemson.

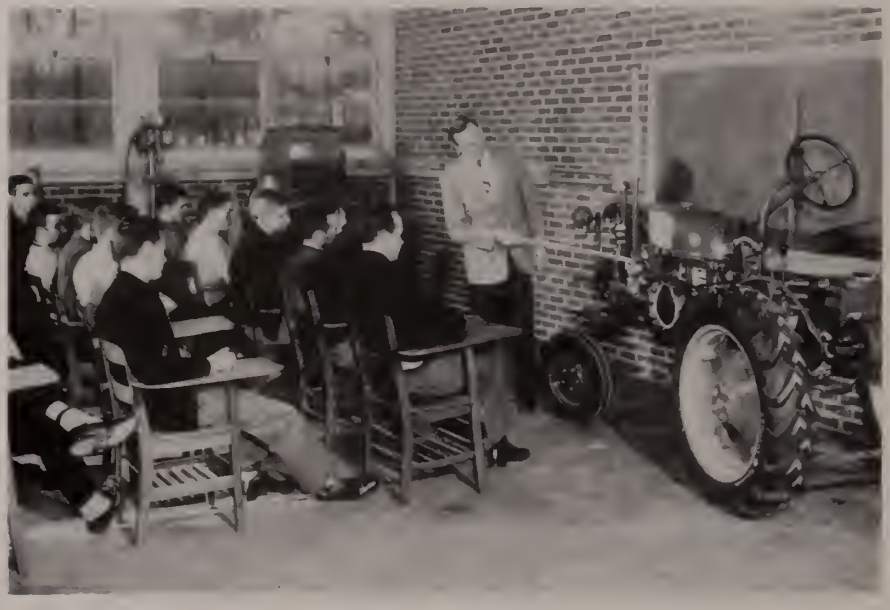
Agriculture Economics professor assisting student in a laboratory section of statistics.

Agricultura

Soil and Water Conservation

Farm Structures

By R. H. Ramsey



"What makes it tick"

It has been estimated that 85 percent of the problems of Agriculture involve Engineering. The need for men with a dual knowledge of the sciences of Agriculture and the principles of engineering to bridge the gap between Agriculture and Engineering created the profession of Agricultural Engineering. Its importance as a profession has grown by leaps and bounds as Agriculture has adapted itself to this modern age.

No longer is Agriculture in the form of a simple business, it is now a complex industry faced with labor shortages and difficult economic problems. Just as industry is concerned with the maximum productivity and efficiency from its manufacturing plants and employees, so Agriculture is concerned with its manpower and its manufacturing plants — the soil. The Agricultural Engineer plays an important role in increasing the efficiency and productivity of the agricultural enterprises of today by applying his knowledge of mathematics, the physical sciences, and principles of engineering to this vast and complex industry.

The fields of Agricultural Engineering commonly emphasized are: farm power and machinery, soil and water conservation engineering, farm structures, electric power, and the processing of agricultural products. It is through these basic areas that agricultural enterprises are supplied with facilities, material and knowledge for more efficient operations. The engineering principles may be directly applied to the farm enterprise itself such as in the design of a more efficient and economical structure for livestock, or they may be applied indirectly to the industries that supply the farmer with agricultural necessities. Engineering principles are also applied in industries that utilize products from the farm such as the processing of feeds at a lower cost or through more efficient storage and handling of the farmer's product.

The question, "who hires Agricultural Engineers," may be asked. For many years more than one half of the number of Agricultural Engineers were in public employment. The trend now is toward a much greater employment of Agricultural Engineers by industry and other private agencies. It is believed that the future growth of the profession will be largely in the direction of commerce and industry.

In public service, Agricultural Engineers are on the staffs of agricultural colleges and their experiment stations. Most of them carry on research, investigation or extension work along with teaching. They are likewise on the staffs of other federal government agencies such as Tennessee Valley Authority, Soil Conservation Service, the Department of Interior, and the Rural Electrification Administration.

In industry, Agricultural Engineers are employed by the companies which serve Agriculture. In the farm equipment industry they develop new machines or improve old ones. They are employed by feed manufacturing plants, the electric power and equipment industries, the food processing industries and a host of other concerns that supply agricultural necessities or utilize agricultural products. They serve on the research and development, production, and sales staffs of these industries and their pay and promotions are comparable to professional engineers in other fields.

Engineering

Electric Power

Farm Power and Machinery

Agricultural Engineering '57

Another role which the Agricultural Engineer is well trained to play is that of the farmer. He is well prepared to utilize and cope with the mechanization of the modern day farm. Through his acquired knowledge of farm power and machinery, the use of electric power, irrigation, and other soil and water conservation practices, the Agricultural Engineer is able to farm more efficiently and productively.

Before deciding to become an Agricultural Engineer, one should bear in mind two main requirements. He should have a real interest in, indeed an affection for, the things of the farm—its rural environment, its people, its crops and animals, its soils and its open sky, its place in the nation as the supplier of food and fiber, and its way of life. It is best for the potential Agricultural Engineer to have had farm experience but that is not essential. Other important characteristics of the potential engineer are an aptitude for mathematics and the ability to properly use the English Language.

The Department of Agricultural Engineering at Clemson has the largest number of students enrolled in its curriculum of all the institutions offering this degree in the southeastern area and ranks very close to the larger schools in the nation. The present undergraduate enrollment is 102. The department has been accredited by the Engineers Council for Professional Development, a nationally recognized accrediting agency for engineering curricula.

The Agricultural Engineering curriculum at Clemson comes under the joint administration of the Schools of Agriculture and Engineering. The curriculum is made up of basic courses in both agriculture and engineering. Concurrently, courses in the humanities, as well as the physical sciences and mathematics, are integrated into the program. The advanced courses in Agricultural Engineering introduce the student to broad and specialized training in five areas by the application of basic fundamentals to practical problems. These are: Farm Power, Farm Electrification, Soil and Water Conservation Engineering, Farm Structures, and Agricultural Product Processing.

The department is housed in the Agricultural Engineering building located on the campus. It is a modern brick building and contains ample facilities for both classroom work and laboratory exercises. The equipment used is modern and up-to-date and is furnished in part by leading farm equipment manufacturers and distributors who have furnished their products for demonstration, classroom and field laboratory work, and research in the overall Agricultural Engineering program.

Along with the building and its equipment the Agricultural Engineering Department has been assigned approximately 580 acres of the Clemson College farm lands to furnish additional facilities for teaching, research, and demonstrations.

The Department has continuously grown in size and importance in the southeastern area. The staff is adequate and well trained. They are continually trying to increase the quality of the courses taught in the undergraduate program and are presently embarked on building a graduate school program to fill the needs that industry and the public services are requiring.

The importance and need for Agricultural Engineers is growing. No other branch of Engineering reaches out in so many directions and in so many various ways.

Man-made rain — from pump to crop.

Agronomy

Crop Science Soil Science

Talbert Gerald and Wendell Brown
Agronomy '57

Because of our rapidly growing population, agronomy is becoming more important each year. In another 20 years it is estimated that in this country we will need 30% more food than we produce today. This extra food must come from the same acreage of cropland we now have. Because we have no frontiers of new land, we must push forward on a new kind of frontier—the frontier of scientific farming. This is our best means of increasing food and fiber production in the future. Tremendous advances are being made by putting science to work in many of the branches of agronomy such as crop fertilization, plant breeding, soil conservation, and weed control.

What is Agronomy? This is a question often asked the agronomist by the man on the street and even by farm people. The word Agronomy is important to our everyday life because it represents the science which deals with the study of our priceless heritage—the soil, and our cheapest source of food—crops. Not only is the agronomist trained in the basic principles dealing with soils and crops, but also in the application of these principles to good soil management and crop production.

A better meaning of the term agronomist may be obtained by a knowledge of the various job opportunities in this important field of study. Many opportunities are available to college agronomy graduates in agricultural research at state and federal experiment stations. Research in soils may be in such fields as fertilizers and soil fertility, soil classification, soil physics, soil chemistry ,soil conservation and soil microbiology. Some of the fields of crops research are plant breeding, seed production and processing, and general field crop production including forage and pasture crops. Agronomists are also employed as promotion or sales representatives with fertilizer and seed concerns. At present many agronomists are needed by the U. S. Department of Agriculture for jobs in soil classification and survey. Jobs are available with the Soil Conservation Service as agronomist or soil scientist, and with the Federal and State Extension Service as county agent, district agent, and specialist in agronomy. Some agronomists are hired as farm managers, land appraisers and tax assessors. Because of the broad training received in a general agronomy course, many farm boys planning to return to the farm have taken this course in college. According to a recent survey it is estimated that about twenty percent of the graduates in agronomy at Clemson are full or part time farmers.

At Clemson the Agronomy Department includes teaching, research, and extension personnel. Unlike at many agricultural institutions the Agronomy curricula at Clemson is not divided into separate crops and soils so that agronomy students are trained in both of these fields. In addition to basic crops and soils courses in agronomy Clemson requires such courses as soil conservation, fertilizers, forage and pasture crops, advanced crop and seed laboratory, soil analysis, cotton and tobacco, genetics, plant breeding, soil microbiology, soil fertility, crop and soil seminar and introduction to research. Also many agriculture courses are required that are given in other departments such as agricultural engineering, botany, entomology, agricultural economics, horticulture, animal husbandry, dairy, forestry, and poultry.

The agronomy student at Clemson must also study government, literature, public speaking, social science, mathematics, chemistry, physics and other subjects needed to make a well-rounded college education. Although certain courses are required of all students in agronomy at Clemson, there is an opportunity to select many others according to the interest of the student. Not all of

Agronomy majors receiving instruction in crop and weed seed identification.

the course work is in the classroom. Clemson students spend a good deal of time in well-equipped laboratories, on experimental fields, at demonstrations, and on field trips.

The agronomy teaching and research facilities at Clemson compare favorably with any other Agronomy department in the nation. In 1955 the department at Clemson moved in the new and modern Plant and Animal Science building. This air conditioned and artificially lighted building is well equipped with laboratories for teaching crops, soils, and genetics. Research laboratories with the latest scientific equipment are available for research in all phases of agronomy. Located a short distance from the agricultural building are three large and well equipped greenhouses available to the Agronomy Department for research and teaching.

Closely associated with the Agronomy Department at Clemson are the services of soil testing, seed certification, and fertilizer inspection and analysis. Agronomy students gain much information thru visits to these agencies as well as thru visits to agronomy field experiments. Students are trained also in seed certification, seed cleaning, and seed grading by visits to the foundation seed laboratory located at the college. To assist students financially with their college education some students work part time in the soil testing laboratory or as assistants in the agronomy teaching and research programs.

The instructors in Agronomy at Clemson enjoy helping students. They are dedicated to the service of agriculture and farm people. One will find that many of them are known widely for their teaching ability and scholarly achievements.

We Agronomy students at Clemson have a club composed entirely of students majoring in Agronomy. Our organization is called the Kappa Alpha Sigma Chapter of the Student Section of the American Society of Agronomy. The purpose of this organization is to foster a spirit of cooperation and mutual helpfulness among Agronomy members and the members of the staff of the Department, to stimulate interest in the Agronomy profession among students, to correlate activities in agronomy with those in closely related fields of endeavor. Besides social activities the Club sponsors educational projects. In the spring of 1956 the Club sponsored an educational trip for Agronomy students to Virginia and North Carolina and visited fertilizer manufacturing plants, cigarette factories, experiment stations, and other places of agronomic interest.

Agronomy professor using profiles of South Carolina soils to explain how soil differences may influence the use and management of soils.

Since the organization of the Agronomy Department in 1914, nearly 650 Clemson men have obtained the B.S. degree in Agronomy. These Agronomy graduates are now living in many states and in several foreign countries. Fortunately for South Carolina, most of our Agronomy graduates are still within the state. A recent survey shows that Clemson Agronomy graduates as a group have been very successful.

Animal Husbandry

Production and Management of Meat Animals

R. H. Hammond, Jr., A.H. '57

Grooming of Aberdeen-Angus bull by animal husbandry class.

Animal Husbandry is a combination of the science and art of breeding, feeding and management of beef cattle, swine, sheep and horses.

The primary objectives of the Animal Husbandry Department are (1) to train students in all phases of livestock production, (2) to conduct an aggressive research program designed to develop more efficient methods of production, and (3) to disseminate pertinent information to people interested in the various phases of Animal Husbandry.

Students majoring in Animal Husbandry have unlimited job opportunities in numerous fields such as: Representatives of various breed associations, the Extension Service (Assistant County Agent, County Agent, Livestock Specialist), general farming, livestock farming, farm managers for general and livestock farms, feed companies (feed salesmen or plant work mixing rations), graduate study, livestock herdsmen, meat packing plants (buying livestock, supervising meat coolers, supervising meat processing, salesmen), experimental work (with colleges, U. S. Department of Agriculture, and feed and meat industries), and teaching.

The Animal Husbandry Department has excellent facilities for the teaching program. The class rooms and offices are located in the new Plant and Animal Science Building which is completely air-conditioned. The Meats Laboratory, located in the Food Industry Building, is considered one of the most modern in the country.

There is an Aberdeen-Angus and Polled Hereford herd near the campus and both are used extensively in the teaching program. These herds give students an opportunity to observe and work with outstanding purebred cattle. The swine unit consists of Beltsville No. 1, Berkshire, Hampshire, Yorkshire and Poland China breeds of hogs. These are used in laboratory class to teach students practical pork production. There is a steer feeding operation located on the campus where students have the opportunity to observe cattle while being fattened. Within the last few years a modern sheep barn has been constructed and sheep have been purchased for teaching and research purposes.

A student majoring in Animal Husbandry spends most of the first two years studying the basic courses as Mathematics, English, Chemistry, Physics, etc. Also, during this period the students take a course in each of the other curricula in the School of Agriculture. The last two years are devoted primarily to Animal Husbandry courses with some work in supporting fields.

The courses offered in Animal Husbandry are: Types and Breeds, Feeds and Feeding, Judging, Pork Production, Horse and Sheep Production, Meats, Animal Breeding, and Seminar.

The Types and Breeds course is an introductory one which is required of all students in the School of Agriculture. This coure is devoted primarily to the study of breed characteristics, principal areas of livestock production in the United States, and general production and management practices.

The course in Feeds and Feeding deals with a study of feed nutrients such as vitamins, minerals and their function in the animal body. Considerable time is devoted to figuring and balancing rations for all classes of livestock including breeding animals and animals intended for slaughter.

The three production courses (Beef, Pork and Horse and Sheep) deal with practical production problems such as care of the young, castration, sanitation, disease and parasite control, grazing and dry lot rations.

A Judging course is offered to train students to select breeding stock. Also, the selection of slaughter animals is given considerable emphasis.

In the Meats course students get considerable practical experience such as estimating dressing percentages, grading carcasses, cutting carcasses into wholesale and retail cuts and identifying retail cuts.

Students in Animal Breeding study the technical and practical application of genetics in animal improvement. Emphasis is also placed on reproduction including the organs of the reproductive tract, their functions and control.

Seminar provides the students with an opportunity to review recent research investigations. Each student reports orally to the class on topics of timely interest. These reports are taken from scientific journals and publications in which the latest research data are found.

The Animal Husbandry student organization is the Block and Bridle Club. This Club is affiliated with the National Chapter and sends two delegates to the National Convention in Chicago each year. The Club sponsors several events during the year. One is financial support of the Livestock Judging Team which participates in several inter-collegiate contests annually, and others are the Freshmen Livestock Judging Contest and the Clemson Little International. During these two events, students participate in competitive showing and judging of livestock.

For outstanding students who desire to continue their education, the Animal Husbandry Department provides a curriculum which leads to the M.S. Degree. This curriculum provides additional training in Chemistry, Statistics, advanced courses in Animal Breeding and Animal Nutrition and Research.

The various herds and sheep flock are used for research work in addition to teaching purposes. In addition to the livestock located at Clemson, there is livestock at three branch stations as follows: Edisto Experiment Station, Blackville, South Carolina (cattle), Coast Experiment Station, Summerville, South Carolina (cattle and hogs), and the Clemson College Sheep Experiment Station, Wellman Division, Johnsonville, South Carolina (sheep). Research and teaching are inseparable. since the information gathered from the research projects is used in Animal Husbandry undergraduate and graduate teaching programs.

Students inspect lambs from pure bred flock located at Clemson.

The Extension Service functions as the disseminating agent for information going from the Experiment Station to the livestock producer. The Livestock Extension Service has the following specialists; beef cattle, swine, sheep and marketing.

Botany and Bacteriology

Plant Diseases
Taxonomy
Weed Control
Plant Physiology

By Gene Stembridge
Hort. '57

Botany is a basic science which deals with plants and involves the study of the diseases, structure, classification, and physiology of plants. The Botany Department, as it is commonly known, is in reality the Department of Botany and Bacteriology. Bacteriology has been combined with Botany because it is also a study of plants, even though they are the microscopic, one-celled type.

The Botany Department does not offer a curriculum leading to a B.S. degree. Instead it serves in the capacity of a "Service Department," providing training in the basic botanical sciences to students in the Schools of Agriculture, Arts and Sciences and Engineering. Courses are offerend in General Botany, as well as in more advanced fields, such as Bacteriology, a study of bacteria; Plant Pathology, which deals with the diseases of plants; Plant Physiology, a study of the plant's life processes; and Taxonomy, which is a study of the classification of plants.

The department also offers graduate training leading to advanced degrees in Plant Pathology. The number of advanced students is small, but it is anticipated that the program will grow within the next few years.

Every agriculture major and many students in the School of Arts and Sciences will find botany courses in their curricula. Students majoring in agronomy or horticulture, which are branches of applied botany, find that their curricula may call for as many as five courses in the Botany Department. The student's first impression may be that he has an excessive number of botany courses in his curriculum, but his viewpoint will quickly change when he realizes that botany is one of the foundations of agriculture. A basic understanding of plants is the keystone to their successful production, management, and utilization. The complete dependency of animals on green plants gives botany its importance.

Since it is a foundation of agriculture, Botany is a basic and essential part of every agriculture student's college work. The words of Thomas Jefferson still holds true:

> "Botany I rank with the most valuable sciences, whether we consider its subjects as furnishing the principal subsistence of life to man and beast, delicious varieties for our tables, refreshments from our orchards, the adornment of our flower borders, shade and perfume of our groves, materials for our buildings, or medicaments for our bodies."

The Department of Botany currently has four full-time and three part-time teaching positions. The teachers were so selected that they represent specialists in the various fields of Botany. The seven full or part-time teachers include a Bacteriologist, a Microbiologist, a Taxonomist, a Physiologist, an Ecologist and two Pathologists. In addition to the teachers, the Botany Department contains twelve full time persons involved in research directed toward the control of plant diseases and weeds in South Carolina crops. Since diseases of plants are of such great economic importance in South Carolina agriculture, most of the efforts of the research staff are aimed toward their control.

The agriculture students entering Clemson are required, in their freshman year, to take General Botany. Then in their Junior year, most of them will return for a course in General Bacteriology. Those students who decide to major in one of the applied botanical sciences, such as Pre-Forestry, Horticulture or Agronomy, will take such additional courses as plant Pathology, Plant Physiology, Taxonomy

General Botany Laboratory in which students are studying the structure of a flower through use of a large scale model.

and Soil Microbiology. Dairy students are given a course in Dairy Bacteriology. Thus, as stated above, the Botany Department is a Service Department which aids in the training of students majoring in all of the various phases of Agriculture.

Many Arts and Science students are required to take General Botany and certain of them, notably the Pre-Medicine students, take one or more courses in Bacteriology. Students majoring in Civil Engineering are offered training in Sanitary Bacteriology dealing with water purification and sewage disposal.

Classes are conducted not only in the classroom, but also in laboratories, greenhouses, fields and forests. Students studying plant diseases are taken on field trips to the college farms to see diseases of cotton, corn, small grains, fruits, and vegetables. Taxonomy students are taken to areas in the vicinity of Clemson where specific plants may be studied. Training in the botanical sciences thus includes practical laboratory and field training, as well as formal classroom instruction.

There is at present a serious shortage of men trained in the various botanical sciences. Men trained in these fields may enter anyone of several types of positions. Most of them go into one of the following: teaching of the botanical sciences at the college level or of biology at the high school or college level; research in the control of weeds or plant diseases or in other phases of basic or applied botany; extension work as specialists in weed or disease control; commercial work in the development, promotion or sales of chemicals used in agricultural pest control; or in regulatory work concerned with the control of plant pests through inspections and quarantines.

Students in General Bacteriology laboratory transferring cultures and observing stained bacterial mounts.

The Men Who Guide Us

Professor Duane Benjamin Rosenkrans, held in high esteem by thousands of Clemson students for his instructional ability and manner of dealing with students, has been an instructor in the Botany department since August of 1913. He was born in Edgewood, Iowa, where he spent his early life. After attending upper Iowa University, where he received his A.B. degree in 1911, he was instructor of botany at N. C. State until 1913 when he came to Clemson. Mr. Rosenkrans has also worked as an agent for the U.S.D.A. Bureau of Plant Industry for five summers. While at Clemson he has written many bulletins on Forest Trees of South Carolina, articles on plant diseases, assisted in preparing a bulletin on weeds, and many weekly news articles for the Agricultural extension service. Mr. Rosenkrans is now working on a list of plants in South Carolina that have been identified. This list will include over 1700 species of plants which are classified into 150 families. This list is expected to be out around June or July.

He is a member of the Iowa Academy of Science, American Association for the Advancement of Science, Masons, American Forestry Association, and Pendleton Farmer's Society.

Mr. Rosenkrans expects to retire in June of this year and make his home at Clemson.

Professor James B. Monroe comes to us from Marion, S. C. He is a Clemson graduate and has a Master's degree from Texas A&M College. He has also done graduate work at Cornell University and the University of Chicago.

Mr. Monroe taught vocational agriculture in Texas, South Carolina and Illinois. He served as superintendent of the New Waverly Independent School District at New Waverly, Texas for eight years. At one time he was Assistant State Supervisor of Agricultural Education in the South Carolina State Department of Education.

Mr. Monroe came to Clemson in 1934 as associate professor of Education. He has served as Head of the Department of Agricultural Education for the past eight years.

In 1941 Mr. Monroe served as Special Representative in the U. S. Office of Education where he supervised shop training in the agricultural departments in Georgia, Florida, South Carolina and Alabama.

He is a member of the South Carolina State Teachers Association, State Employer's Association, State Guidance Association, American Personnel and Guidance Association, Alpha Tau Alpha, State Agricultural Teachers Association and the American Vocational Association.

James B. Monroe

Dr. Herbert Press Cooper, of the Agronomy Department, is an outstanding agricultural figure in South Carolina, the nation, and the world. Dr. Cooper was born at Ridgeway, South Carolina, and received his B.S. degree from Clemson in 1911. He then attended the University of Wisconsin where he received his M.S. degree in 1916. After teaching at Penn State College and Cornell University, he received his Ph.D. degree from the latter and became assistant professor of field crops there in 1922. In 1930 he returned to Clemson as professor of Agronomy. For a long period of time he served as Dean of the School of Agriculture and Director of the South Carolina Experiment Station.

He is a member of the following societies: Sigma Xi, Phi Kappa Phi, Alpha Zeta, Kiwanis Club, A.A.A.S., American Chemical Society, American Society of Agronomy, American Society of Plant Physiology, American Soil Science Society, and the International Soil Science Society. Dr. Cooper served as president of the American Society of Agronomy and has written and presented numerous papers before many professional organizations such as the American Society of Agronomy and the American Chemical Society. His theories of plant nutrition and the cause of bloat in cattle have been subjects of world wide discussions.

BETWEEN C

Sowed by

"LITTLE INTERNATIONAL"

The Block and Bridle Club is sponsoring the first annual "Clemson Little International" Livestock Show April 13 at Clemson. It will consist of a showmanship contest for college students, 4-H, FFA and freshmen (Clemson) judging contest, and also a beauty contest. This show will be the largest of its kind ever to be held in this State and is expected to draw a large attendance of interested livestock farmers, high school students and others to Clemson College on Saturday, April 13, 1957.

There will be a large number of 4-H and FFA livestock judging teams participating and a large number of nice trophies and awards will be presented to the winners in both the judging contest and to the showmanship winners in cattle, swine and sheep classes. A champion and reserve champion showman will be chosen from the class winners. Any 4-H or FFA leader throughout the State who is interested in his team competing in either the 4-H or FFA judging contest should notify J. E. Cox, President, Block and Bridle Club, Box 2355, College Station, Clemson, South Carolina.

NUTRITION FROM THE COW'S POINT OF VIEW

The howling winds of winter came,
The dried up grass was thin.
The farmer saw with troubled eyes
Bones pushing through my skin,
He called the neighbors for and near
To find out what might ail me.
The things they said and did to me
Made all my courage fail me.
At first they said I'd hollow horn
So they sawed them off you see.
And then they said I'd lost by cud
Which really puzzled me.
As I grew more frail they split my tail,
Those ill informed dear gents.
At every turn I could feel the burn
Of fiery liniments.
Then came shots and salves of every kind
With oitments strong and smelly.
But they still don't see what's killing me
Is PLAIN OLD HOLLOW BELLY.

—Author unknown

NEW BACTERIOLOGY LAB EQUIPMENT

The Bacteriology Department has recently acquired some new equipment which will be used in the identification of pollution organisms in water and milk. It may also be used for the identification of any disease causing organisms. By using this equipment the time necessary for a complete test will be reduced from three days to about 20 to 24 hours. This equipment has been the development of various research groups in the anticipation of germ warfare which might be encountered in the future.

RESEARCH ON THE BIOLOGICAL CONTROL OF SOIL BORNE PLANT DISEASES

Professor John H. Bond, Bachelor and Master's degree from the University of Louisiana, is carrying on a screening program to isolate soil microorganisms that are harmful to plant disease causing organisms. After these microorganims are isolated they will be studied in their natural soil environment to determine their relationship with the occurrence of plant diseases in the Southeast. The results of this work will be applied in the biological control of soil borne plant diseases.

ALUMNI NEWS

Frank C. Bauknight, Agricultural Economics graduate in the class of '30 is in charge of the United States Department of Agriculture Cotton Classing Service with headquarters in Columbia, South Carolina.

O. Romaine Smith, former basketball standout at Clemson, is youth editor for **The Progressive Farmer,** with offices in Atlanta, Georgia. Romaine is an Agricultural Economics graduate in the class of 1933.

W. S. Reasonover, Agricultural Economics graduate in 1947, is General Manager of Alaska Methodist College, Anchorage, Alaska. Bill is a former Editor of The Tiger.

Steve Phillips, formerly of Lancaster, S. C., has chosen the army as a career. He taught Military Science at U.C.L.A. for three years, served two years in Alaska, and is presently in command of a battalion of W.A.C's at Fort Leavenworth, Kansas. Steve is an Agricultural Economics graduate in the class of 1942.

Clemson's New Agricultural Center

Aerial view of New Agricultural Center—Two-story Plant and Animal Science Building in foreground. Food Industries Building and ten greenhouses in the background.

Two new buildings along with ten greenhouses make up the new Clemson Agricultural Center. These facilities, completed in 1955, give the state of South Carolina one of the most modern and best equipped agricultural units anywhere. The two new buildings are known as the Plant and Animal Science Building and the Food Industries Building.

The completely air-conditioned Plant and Animal Science Building furnishes classrooms, laboratory facilities, and office space for teaching, research, and extension personnel. Located on the first floor are the departments of Horticulture, Forestry, Vocational Agricultural Education, Poultry, Dairying, and agricultural divisions of the Extension Service. Also located on the first floor is an agricultural library and reading room for students and faculty.

The top floor of the Plant and Animal Science Building houses the Agronomy Department, the Animal Husbandry Department, the Fertilizer Inspection and Analysis Department, Farms, Nutrition, and Seed Certification Departments, 4-H Club offices, and Chemistry Research and Soils Testing Laboratories.

The Food Industries Building provides facilities for processing fruits and vegetables, beef and pork, and dairy and poultry products. The departments of Horticulture, Animal Husbandry Dairying, and Poultry have both teaching and research facilities in this modern building.

Adjacent to the two new buildings are ten well equipped greenhouses. These greenhouses are used by the departments of Agronomy, Horticulture, and Botany to further the research, teaching, and extension programs.

Dairying

Production and Manufacture

By Dixon Lee, Dairy '57

The Dairy Industry in the United States furnishes employment for 23,600,000 people or about one-seventh of the total population. This industry offers a wide range of occupations. People from practically all walks of life are needed for the farm production of milk, the processing and manufacturing of milk, and the distribution of dairy products.

Located in the new Agricultural Center on the Clemson Campus, the Dairy Department has modern laboratories and a well-equipped milk processing and manufacturing plant for teaching and research.

The large dairy herd operation, located near the campus, provides students and the staff with complete facilities for studying modern trends in dairy cattle feeding, breeding and management.

The Dairy Department curriculum in dairy science and technology is designed to equip young people for leadership in an industry with a gross income of over five and one-half billion dollars per year. This curriculum provides training in the science and in the practical phases of dairying. A brief description of these fields of study is presented to acquaint the prospective college student with an idea of the knowledge and opportunities available to a student taking major work in the Dairy Department.

The Milk Processing Plant used for teaching and research.

Bacteriology—

Bacteriology is a biological science dealing with bacteria, viruses, yeasts, molds and protozoa. The controlled growth and chemical activity of micro-organisms have infinite practical applications in agriculture and industry.

Dairying is so closely concerned with bacteriology that it has become a part of the dairy curriculum in most agricultural colleges. An opportunity for students to observe and participate in various phases of this work is afforded through laboratory assignments and undergraduate research projects.

Chemistry—

Milk contains fats, carbohydrates, proteins, vitamins, minerals and enzymes in addition to water. This diversified composition means that the scope of dairy chemistry must necessarily include the fields of organic, inorganic and biochemistry. Without dairy chemistry it would be impossible to understand the processes through which dairy products are manufactured. Many of the defects that appear in dairy products can be prevented through the knowledge of dairy chemistry.

Advertising and Marketing—

This course presents the field of advertising from the standpoint of development, economics and functions, truth in advertising, channels of trade and research with the product and of the markets.

A study is made of present- action advertising, types of appeals, copy writing, trade marks, slogans, and of all media used in advertising. The operational side of advertising is presented through discussions and lectures concerning advertising agencies, selection of medium, advertising campaigns, testing advertising, and by working with dealers.

Nutrition—

Modern nutrition includes the balancing and using of amino acids, minerals, vitamins, antibiotics, and hormones. Animal nutrition is included in the dairy course to provide a basic understanding of the chemistry and physiology of digestion, absorption, and metabolism of carbohydrates, fats, proteins, minerals, vitamins, and feed additives by farm animals. Methods of measuring the utilization of feed nutrients and requirements for maintenance, growth, reproduction, and lactation are studied in relation to the physiological requirements.

Physiology—

Physiology is a science dealing with the normal vital processes of living things. The application to dairying is carried out by both teaching and research in the Clemson Dairy Department.

In teaching, there are two courses offered on the undergraduate level; one, in the artificial insemination of farm animals, and the other in endocrinology. The artificial insemination course gives both a theoretical and practical background in a field which has done much to improve the quality of dairy cattle in South Carolina in recent years. Endocrinology, a study of the ductless glands, gives the student a fundamental background in growth, reproduction, and lactation.

Genetics—

Genetics is the biological science which deals with the inheritance of

plants and animals. The laws governing the transmission of characters from parent to offspring provide the basis for the resemblances and differences among individuals related by descent.

A knowledge of the principles of genetics is the basis for using systems of breeding plants and animals to obtain more favorable combinations of inherited factors in the offsprings. Inbreeding and crossbreeding produced hybrid corn. The crossbreeding of family lines in purebreds and the alternation of the breed of the bull used for the generations are systems of breeding dairy cattle available for student training and for research at the student and staff levels.

Operations and Management—

The production of milk on the farm is a manufacturing operation with the dairy cow serving as the machine for converting the raw material, feed, into the finished product, milk. The dairy farmer is the manager of this operation. The dairy processing plant requires milk as the raw material. Modern, sanitary equipment provides for a continuous flow of the milk through many processes whereby it is received, pasteurized, cooled and bottled in one operation.

The Dairy Cattle Center used for teaching and research.

The successful management of a manufacturing plant requires the coordination of a series of operations according to a definite plan. The raw materials must be assembled and stored conveniently for processing in a regulated movement. The selling of the finished product is organized to meet the production schedule.

Students graduating with a dairy major at Clemson have a choice of either manufacturing or production as their field of work.

Entomology and Zoology

Insect Identification

Insect Control

By W. P. Dubose, Jr., Ent. '57

Students cage boll weevils on dusted cotton plants at the insectory.

The Department of Entomology and Zoology has maintained the leadership in teaching, research and extension phases of entomology in the State of South Carolina for more than 42 years. This department has supplied the necessary fundamental courses and leadership in the fields of zoology and wildlife management for students attending Clemson College.

Clemson Agricultural College is the only institution in South Carolina offering a degree in the field of entomology. This field has been in the curriculum of the college since the college opened in 1893; however, it was not until 1899 that a division of entomology came into being. In 1914 the division began offering a major in entomology and has done so since, awarding approximately 140 B.S. degrees and awarding eight M.S. degrees since 1953 when the department began to offer advanced degrees in entomology. Recently, this department has been granted approval to offer a Ph.D. degree.

In addition to the instruction in entomology that is offered at the college, the department participates in an off-campus instructional program.

The courses in entomology offered at Clemson include taxonomy, morphology, medical entomology, economic entomology, and bee culture. A reference collection of more than 100,000 specimens of insects is available to advanced undergraduate and graduate students. The natural conditions surrounding Clemson lends opportunity to conduct original research and practice in entomological techniques.

Insects cost the people of South Carolina several millions of dollars annually, for insects compete with people for food, shelter, fiber for clothing, and life itself. Realizing this importance of insects to the economy of South Carolina, experiments and observations on insects were begun in South Carolina by the State Agricultural Experiment Station as early as 1888.

Research in entomology is being conducted at the main station at Clemson and at all the branch stations except one.

Extension entomology plays an important role in the program. Extension entomologists of this state carry the findings of the research workers to the farmers.

Students receiving instruction in beginning Zoology Laboratory.

An undergraduate (B.S.) degree in zoology is not offered by the college, although this subject has been offered since the college was established. However, in 1952, the Entomology and Zoology Department began to offer graduate work toward a master's degree in zoology, awarding six M.S. degrees in zoology since that date. Among the courses offered in zoology are: general and advanced zoology, embryology, parasitology, and diseases of animals.

Realizing the opportunities afforded by the extensive land areas surrounding the college, the department presented a four year curriculum in wildlife management which was approved in 1955. Due to insufficient funds and personnel, this curriculum has not been put into effect. It is anticipated that this curriculum will be offered in the very near future.

What is entomology? What does an entomologist do? What are the opportunities for the graduate in entomology?

Has it ever occurred to you that entomology is one of the most interesting and important of all the biological sciences? Chances are you have never thought about it before.

Entomology is the science which deals with insects. Insects affect man's welfare and his pocketbook in many ways.

For many people entomology is a fascinating hobby or an intensely interesting study. Some collect insects such as butterflies, moths, or beetles. Others spend much time observing the habits and behavior of insects and their relatives. For some 4,500 men and women in the United States; however, entomology is also a profession. Some entomologists teach, some conduct research, some enforce quarantine rules, some sell insecticides, and others furnish pest control services.

The greatest number of professional entomologists work in some branch of economic or applied entomology which deals with the study of insects in relation to man and his welfare. The ultimate goal is to control the numbers of insects; to decrease the harmful and increase the beneficial species.

Of the 4,500 professional entomologists, 32 per cent work for the U. S. Department of Agriculture; 10 per cent for other Federal agencies; and 15 per cent for state colleges, universities, and experiment stations. Other employers are insecticide manufacturers, commercial pest control firms, privately endowed colleges, universities, and museum's and private research foundations.

There will always be a need for qualified entomologists. Insect problems are steadily increasing in number and complexity. Although it is impossible to say just how many positions will be open at any time, there has been a steady growth in the field, and this growth will no doubt continue. Financial rewards to members of this profession are comparable to those enjoyed by most other scientists.

Each phase of entomology has its attraction to students with a bent toword biological sciences. The graduate of entomology has never experienced any difficulty in being placed in fields of professional entomology for the department has maintained a high standard of instruction for its students, thereby making them valuable to the profession. It is hoped that all who read this article will gain in understanding and that some will become entomologists.

Horticulture

Fruits — Vegetables — Food Preservation — Ornamentals

Bobby Skelton, Hort. '57

Horticulture is one of the several departments in the School of Agriculture at Clemson. This department works with fruits, vegetables, ornamental plants, and special crops. The Horticulture Department has a large orchard which includes peaches, pears, apples, and plums. There is a grape vineyard, a blueberry variety test plot, and many vegetable plots, as well as a greenhouse devoted to commercial floriculture, one used for plant propagation, three others used for the breeding of sweet potatoes, peppers, peas, and sesame, and a large collection of ornamental shrubs. Food preservation is included in the Horticulture program. Clemson is the only educational institution in South Carolina that provides instruction in all phases of Horticulture, including Food Preservation, Nursery Management, and Landscape Design.

The Horticulture Department is one of the oldest in the School of Agriculture. As early as 1892 there was an Assistant Horticulturist employed at Clemson to do both teaching and research. Since that time there has been an active Horticulture Department here. During the sixty-four years of teaching and research, much valuable information has been collected and distributed to the fruit and vegetable growers of this and the surrounding states.

At present the Horticulture Department has six faculty members, two of which are on full time teaching. Four are on a basis of part time teaching with research part time.

Class in commercial fruit production using air pressure outfit.

There are also three staff members who devote full time to research work.

Beginning this semester we have twenty-five students majoring in Horticulture. Many students other than Horticulture majors take courses in this department because many of these courses are related to other fields of agriculture. Since few of these classes are large, the professor has enough time to discuss with the students the problems they will have in commercial practice. Consequently, the students derive great benefit from their college work in the Horticulture Department.

Recently we have undergone a building program at Clemson, resulting in many well-designed modern buildings. Two of these are the new agriculture buildings, called "Plant and Animal Science Building," and the "Food and Industries Building". To be sure that all modern facilities were incorporated in the new agricultural buildings, a group of staff members and administrative officials were flown all over the United States to inspect modern agricultural buildings at leading schools. They returned with ideas which, when transmitted via the architect's pencil and the builder's skills, gave us one of the most modern and complete agricultural centers in the country.

The Horticulture Department occupies ten offices in the Plant and Animal Science Building. There are three horticulture students laboratories, one Landscape Drawing room, and sufficient classrooms for teaching all Horticultural courses.

Adjacent to the Plant and Animal Science Building is the Food Industries Building, housing the Horticultural Products Laboratory. In connection with the laboratory, we have six cold storage rooms which can be maintained at desired temperatures. These are used for teaching and research. In this laboratory, the students conduct actual work in food preservation and in doing this they

learn the practical aspects of processing Horticultural crops.

In the field of research, the Horticulture Department has ample acreage for all its experimental work. At the present time the department uses approximately thirty acres of land adjacent to the campus on the east side, up to one hundred acres on what is known as the Kibler Farm, and up to thirty acres on what is known as the Turkey Range. Research work with peaches, apples, pears, plums, brambles, grapes, strawberries, pecans, and ornamentals have employed most of the land adjacent to the campus and on the Kibler Farm. Experimental work with vegetables, especially peppers, okra, and sesame utilizes the Turkey Range. On the Kibler Farm, also, are plots devoted to various kinds of vegetables as well as sesame and aromatic tobacco.

The field of Horticulture accounts for eleven percent of the national farm income. Included in this are fruits, vegetables, and nursery products. Our own state is important, horticulturally speaking. South Carolina has more acres of peaches than any state in the country except California. Spartanburg county has more acres of peaches than any other county in the United States. Likewise, Barnwell county has the distinction of the highest acreage in watermelons.

The Horticulture curriculum at Clemson has been revised this past year. Now the student has a choice of two options — either Ornamentals, Horticulture or Fruits and Vegetables. Under the new program the students are allowed more hours of electives, which enables them to take the courses directly related to their chosen field.

Persons trained in Horticulture qualify for many different types of jobs. Not only jobs in growing the products, but also in handling and marketing them. Industry offers many positions dealing in pest control materials, machinery, fertilizers, and other Horticulture supplies and services; and many Horticulture majors are employed to distribute and demonstrate to the commercial growers. Many graduates qualify for government service positions as food and nursery inspectors. These are only a few of the many jobs opened to Horticulturists.

The students majoring in Horticulture, have formed a club which is a member of the Collegiate Branch of the American Society for Horticultural Science. The club meets twice a month, and is fortunate in having many interesting speakers at the meetings. The club members are served some type of refreshment at each meeting, usually some product prepared by the students in the Horticulture Products Laboratory.

Every other year the School of Agriculture holds a fair. Each department stages exhibitions, demonstrating various phases of departmental work. Last year the Horticulture Club won second prize in the contest of departmental exhibits.

Our country is increasing more rapidly in population today than ever before. An increase in population means a higher consumption of food, much of which is fruits and vegetables. An increase in populations means more homes, resulting in a need for more ornamental plants. All of this points to Horticulture. More Horticultural products are used every day. The Horticulturist's job is to produce these essentials needed by our growing population. More people are needed in this field than ever before, and as long as there are people on the earth, there will be jobs for the Horticulturist.

Students observing the operation of a green pea, southern pea, and lima bean sheller in Horticultural Products Laboratory. Many other types of equipment shown in background.

Freshman Scholarships Available

Fourteen scholarships, ranging in value from $200 to $750 each, are available for freshmen entering the School of Agriculture at Clemson in either the summer or fall of 1957. The total value of these scholarships is in the excess of $4,500.

Further information regarding these scholarships can be obtained by writing to the Agricultural Scholarship Committee at Clemson or from any high school principal, agriculture teacher, or county agent.

The deadline for mailing completed application forms is May 15, 1957. These forms may be obtained by writing to: Agricultural Scholarship Committee, School of Agriculture, Clemson College, Clemson, S. C.

Poultry

Management
Nutrition
Breeding
Marketing

Joseph R. Craddock '57

Poultry plays an important part in the agricultural economy of the United States. The income from poultry and poultry products ranks third in the United States, or 11% of the total of all agricultural products. Poultry also ranks third in South Carolina, and is exceeded in cash income only by cotton and tobacco. The gross income from poultry in South Carolina is approximately $50,000,000 yearly. Poultry production, layers and fryers, in South Carolina does not play as an important role as in some of the Southeastern states, but in turkey production, South Carolina is third in this area following Texas and Virginia.

The poultry industry as we know it today is radically different from backyard flocks of a few decades ago. With the increase in population and the industrial development the country over, the demand for poultry products has increased, making necessary an increase in the size of poultry flocks and specialization in the poultry industry. Poultry operations have become big business which in many phases of the industry is necessary for efficient production and success from the enterprise. Unlike livestock, poultry can be produced near the areas of consumption. At present the production of poultry meat particularly broilers is in the eastern part of the country, where the greatest consuming areas are located.

There are many job opportunities for college trained men in all phases of the poultry industry. The returns from these jobs are well in line with those in other agricultural fields. There is a great demand for men with specialized training in the industry. The number of poultry scientists with advanced degrees as nutritionists, geneticists, and pathologists are far short of the openings available in the commercial poultry industry as well as in our agricultural colleges for teaching, research, and extension. Graduates with a B.S. degree readily find openings in sales and service work for feed companies, advertising and editorial work, technicians in hatcheries and dressing plants and in marketing services. Each of these fields require scientifically trained men.

The Poultry Department at Clemson first offered a course of major study in 1948. Like other departments in the School of Agriculture, the Poultry Department has three functions; teaching, research, and extension. The first poultry major student was graduated in 1949. Since that date a total of 27 Clemson men have been awarded the degree of B.S. in Agriculture with a poultry major. Most of these graduates are successfully engaged in the poultry industry. A general course in poultry is required of all students in the Agriculture school. Other courses are offered for poultry majors in diseases and parasites, incubation and brooding, feeding and management, poultry breeding, grading and processing, and a seminar dealing with current problems. Much time is spent in laboratory work to give the student practical training in the field.

The research program is developed around the problems of the industry of the state in breeding, feeding, management and disease control with both chickens and turkeys. One of the department's important research projects most applicable to the southeast's poultry industry is that of breeding and improvement of strains of White Plymouth Rocks and New Hampshires for meat type and reproduction by individual and family selection. The factors involved in this project include breast type, early feathering, rapid growth, high egg production, fertility, hatchability, and livibility. In the White Plymouth Rocks, the establishment of the dominant white feather pattern is an additional objective. With such a large number of genetic factors involved, the establishment of a uniform strain with all of these de-

On-the-line poultry dressing.

Learning to become Poultry Nutrition Technicians. Weighing amino acid supplement for poultry rations and checking vitamin ingredients.

mediately accomplished, but both in sirable characteristics cannot be im- egg production and in meat type these stocks have been developed to a high degree. In recent comparative tests a pen of the White Plymouth Rock strain laid at the rate of 64% or an average of more than 225 eggs per hen for the year.

The extension work includes the National Poultry Improvement Plan, the National Turkey Improvement Plan, demonstrations and service work with laying flock owners broiler growers, and 4-H Club members.

The Poultry Department is provided with office space, classrooms, and technical laboratories in the Plant and Animal Science Building. The laboratories include a general laboratory, incubation, breeding, nutrition, and a battery brooder room. The poultry disease laboratory is located in the basement of Long Hall, another of the group of agricultural buildings on the campus. A processing plant with modern on-the-line system for killing, scalding, picking, and evisceration for experimental and teaching purposes plus packaging and freezing facilities is in the Food Industries Building.

The poultry farm is located at the edge of the campus. The original plant, constructed in 1926, was a gift of Mr. Barnard M. Baruch, a well known statesman and philanthropist. The farm contains 68 acres of land, on which are service buildings, laying houses, brooder houses, range shelters, and other buildings. From two to three thousand laying hens are kept at all times for experimental purposes. Approximately 1,500 turkeys and 8,000 chicks are hatched annually for use in breeding and feeding experiments and for class work. The products of the poultry farm are used on the campus by various college institutions and in limited sales by faculty personnel.

Clemson's Forestry Curriculum

by Elisha G. Gravely, Pre-Forestry '57

An appropriation to support a four-year curriculum in forestry at Clemson is being requested from the present session of the State Legislature. If the money is apppropriated, it will mean that at long last a complete forestry curriculum will be established in the State of South Carolina.

This curriculum will represent a milestone of progress in retrospect of forestry instruction offered at Clemson from 1903 to the present date. The first forestry subject offered in our college in the foregoing year was entitled "Elements of Forestry" and consisted of a two-hour, one-term Senior lecture, the scope of which was augmented in later years to include a two-hour lecture and a 4-hour laboratory period. During this as well as many subsequent years, forestry instruction at Clemson was confined to the dissemination of elementary knowledge in fields of forest conservation, forest propagation, and lumbering. Special emphasis was placed in these courses on forest utilization tops peculiar to the South.

In 1934 when the first forester was appointed as a faculty member, the instructional program in forestry was broadened by the inauguration of a pre-forestry curriculum for the benefit of future professional foresters while the agricultural students continued to receive instruction in farm forestry. This instruction was discontinued at Clemson from 1936 to 1946. During the same decade, however, the 26,000-acre forest land area now under the jurisdiction of the college was acquired and developed. It is this area, located in the immediate vicinity of the campus and containing varied sites, that puts the potential academic program in forestry at Clemson into a very favorable position. The development of this land received a further impetus after 1946 when the academic program in forestry was restored and Clemson's forestry activities were augmented by the appointment of a staff member taking professional charge of the college forests. This development has been directed, as much as possible, toward making the forests of the college an outdoor laboratory to be used for the fostering of South Carolina's forestry through research, instruction, and demonstration.

Pre-Forestry students studying growth rate of yellow popular in laboratory.

In 1956, the forestry program was relinquished by the Department of Botany and Bacteriology which, up to that year, safe-guarded the collegiate forestry interests of South Carolina. As of July 1 of the foregoing year, an independent Department of Forestry was created and enjoined with the task of further development of forestry at Clemson. It has been a long, hard grind to bring the forestry program to its present status, and much remains to be done before the planned four-year curriculum becomes a reality.

The average person does not have a clear picture of the economic importance of forests and forest products in our State. Approximately 62 per cent or about 12,000,000 acres of South Carolina is in woodlands. They are the source of raw material for the second largest industry in the State, forestry being exceeded only by the textile industry in this respect. South Carolina's forests and wood-using industries account for an annual income of $340,000,000, the full employment of about 30,000 workers, and the major portion of income of an additional 100,000 individuals.

Of course these are all interesting facts, but what has all this to do with a forestry curriculum at Clemson? The primary reason for this course is to provide professionally-trained men for the vast number of industries as well as other agencies engaged in forestry in our State. As it now stands, these industries and agencies have to go out of the State to seek their qualified personnel. This could be a factor in discouraging new wood-using industries from coming into South Carolina. Since these industries play such an important part in our economic welfare, we should try to anticipate their establishment by providing for their personnel needs. Add to this the fact that the agricultural program at Clemson could use a good boost, and you will have a good idea why a forestry curriculum should be established at Clemson.

At present, the pre-forestry student of Clemson prepares himself to continue his studies at any forestry school in the United States. Because of the exceptional forest facilities available at Clemson, students who receive their primary training at our college are usually ahead of students who received their preliminary training at the other colleges and universities. This is an advantage that tends to off-set the disadvantages incurred in transferring from one college to another.

During his first year at Clemson, the forestry student takes the fundamental courses required of any student, such as English, algebra, surveying, chemistry, and physics. These courses serve as the background for more technical ones the student must take later. During the first Sophomore semester, the student takes his survey forestry course known as "Introduction to Forestry," which gives the student a preliminary glimpse of the subjects which he is to study during his Junior and Senior years. This study acquaints him with the fundamentals of identifying trees, of reforesting both cleared and wooded areas, of defending the forest from fire, insects, and fungous pests, of measuring the forest crop, of harvesting this crop, and of making forest products durable and adaptable. He also gains a great deal of practical experience during the weekly three-hour laboratory periods. The second semester, he takes his first technical course, i.e., dendrology—the discipline dealing with the classification and identification of trees. This course is exceptionally good at Clemson, primarily because of the location of our school in a strategic portion of the Central Hardwoods Region . Clemson is just south of the Northern Forest Region which runs parallel to the Appalachian Mountains and just north of the Southern Forest Region. Our students can avail themselves, on or near the campus, of an enviable variety of tree species. This great variety gives the student an invaluable opportunity for study, and thereby he gains a broader knowledge of the distinguishing, silvical, and other technically important characteristics of the different species. From the discussion it becomes clear that Clemson has at her disposal facilities that will enable her faculty to offer an excellent academic program in the field of forestry.

For those who might be interested in this proposed major, we might say that it takes a great love of the out-of-doors and stamina to become a forester. Looking on the brighter side, it should be said that the remuneration of foresters compares well with that offered in other professional fields and that there is a great demand for graduate foresters at present. There is also the fact that, as time goes by, forestry is going to become an activity of increasing importance to the people of the United States.

The shortage of wood products is now being felt more strongly than ever before. The spirit of forest conservation, lying dormant in the minds of so many people, must be brought to life. It must be made to express itself in better timber management of forest and more intensive forest practices. It is with this thought in mind that the School of Agriculture of Clemson College, with the full cooperation of the Board of Trustees, is trying to bring a full-fledged forestry curriculum to Clemson.

Field instruction in dendrology.

Pre-Veterinary

by Pierre Busuiocesco, Pre-Vet '59

Nine years ago the need for veterinarians in the South was such that the five southern schools of veterinary medicine; Alabama Polytechnic Institute, Texas A & M College, Tuskegee Institute, University of Georgia, and Oklahoma A & M College; were unable to train the number of men necessary to provide adequate veterinary services. To facilitate and promote veterinary education fourteen Southern States, South Carolina among them, inaugurated a program of interstate cooperation under provisions of the Southern Regional Education Compact of 1948. According to this program, which is still in operation, the participating states are allowed to send a quota of veterinary students, who have met all entrance requirements, annually to one of the established schools. For each student enrolled in the school of veterinary medicine an annual subsidy of $1,000.00 is paid by the state to the school of veterinary medicine. The students are relieved of any out-of-state tuition fees. This has proved to be a very beneficial plan as the states that did not have educational facilities for training veterinarians can now have them trained at a relatively low cost.

South Carolina is allowed a quota of seven candidates yearly who attend a four year professional course in veterinary medicine at the University of Georgia. The entrance requirements are many and may be divided into three phases; a two-year pre-veterinary course, which is offered at Clemson, an aptitude test and a personal interview.

The Pre-Veterinary curriculum provides a general educational background with particular emphasis on science. In addition to the required general freshman and sophomore subjects such as English, mathematics, physics and history, the student is familiarized with fundamentals in organic and biochemistry, advanced zoology, poultry, dairying, animal husbandry, plant pathology, agronomy and economics. Because is keen and better - than - average of the limited number of students accepted each year, the competition grades are advisable. However, grades are just one of the factors which ultimately decide the acceptance of a student. In the second semester of his sophomore year the applicant is required to take an aptitude test, designed to evaluate his general knowledge and his ability to understand unfamiliar material. He then becomes eligible for a personal interview given at Clemson by a committee from the School of Veterinary Medicine, University of Georgia. Grades, aptitude test rating and the personal interview are the factors upon which the applicant is evaluated, and which finally decide whether he is accepted. Although all of these entrance requirements may seem rather forbidding at first, statistics show that the ratio of admissions to applications in the five southern schools of veterinary medicine has increased considerably in the past eight years. In 1949 at the University of Georgia this ratio was 1:8, while in 1952 it had dropped drastically to 1:3.2. Unfortunately, more recent figures are not available at this time, but one could safely assume that the ratio was approximately the same last year, possibly lower.

Since the quotas assigned to each state in the regional plan have not changed during the period of time considered, the percent increase in admission indicates also a percent decrease in the number of applications. This is significant in that it expresses that the South is receiving more extensive and adequate veterinary service each year. While it is estimated that one hundred veterinarians are needed annually in the South as replacements for those who retire, die, or otherwise leave the profession, statistics indicate that twice that number were graduated annually in the South during the period 1949-1954. Moreover, 150 veterinarians from other regions migrated South during the same period. Yet, despite this increase in the numbers of its veterinarian population, the South in 1952 did not rank more than fairly adequate in veterinary service. South Carolina, for instance, had only one veterinarian for 685 farms.

That the South will become saturated with veterinarians is rather unlikely. Nevertheless, we must realize that the opportunities are not unlimited any longer. The present problem of the South is not to train as many veterinarians as fast as possible, but rather to improve veterinary research facilities and offer better opportunities for men interested in teaching.

Pre-Veterinary students working with balances in Agricultural

LEADING GROWERS OF MANY CROPS DEPEND ON TOXAPHENE FOR SEASON-LONG INSECT CONTROL. FOR EXAMPLE, TOXAPHENE IS OFFICIALLY RECOMMENDED FOR CONTROL OF MORE COTTON INSECTS THAN ANY OTHER INSECTICIDE.

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Vocational Agricultural Education

Teaching F. F. A. Boys, Young Farmers and Adult Farmers

By David A. Buckner
V.A.E. '57

This June, the total number of graduates in Vocational Agricultural Education from Clemson will exceed the one thousandth mark for the period since the curriculum was established in 1918 following the passing of the Smith-Hughes Act in 1917 which provided for such a program.

The curriculum for a prospective agriculture teacher is planned to cover the entire scope of his duties in the school and community in which he will teach after graduation. It includes training in all departments in the school of agriculture, a broad base in the natural and physical sciences and, general subjects as well as professional education courses.

During the first two years of the program the curriculum is the same as in most other majors in agriculture. The freshman and sophomore years include most of the courses in general culture and basic agricultural courses. In the junior year, the student begins to branch out and increase his knowledge in technical agriculture and sciences. The last semester of the senior year consists mainly of professional education courses and directed teaching. During the last six to eight weeks of the semester the student leaves the college and goes out into the state to an approved training center to do directed teaching. These twenty-odd training centers, distributed throughout the state, provide the senior with a period of actual teaching experience under the supervision of a competent agriculture teacher in the area of the state in which the student wishes to teach.

Students participate in Future Farmer activities.

The Agricultural Education staff, headed by J. B. Monroe, consists of five men that have advanced degrees from various sections of the country. These men have had many years of both high school and college teaching experience.

Following graduation, an agricultural major can proceed to do graduate work leading to a Master's degree in Agricultural Education, or he can begin teaching and do graduate work after having experience in the field.

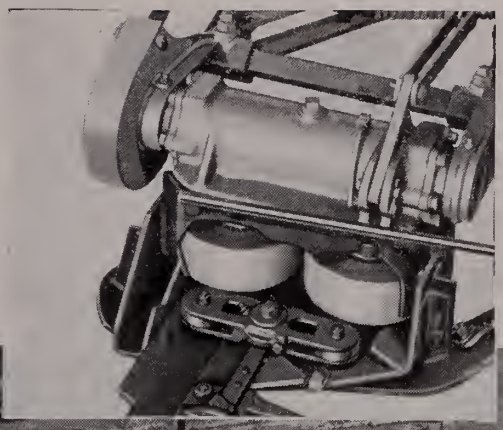
Some of the advantages of being an agriculture teacher are:

(1) enjoyable profession
(2) satisfactory pay
(3) Twelve months employment
(4) useful work
(5) good advancement
(6) varied activities
(7) retirement benefits
(8) vacation with pay
(9) job security
(10) community prestige

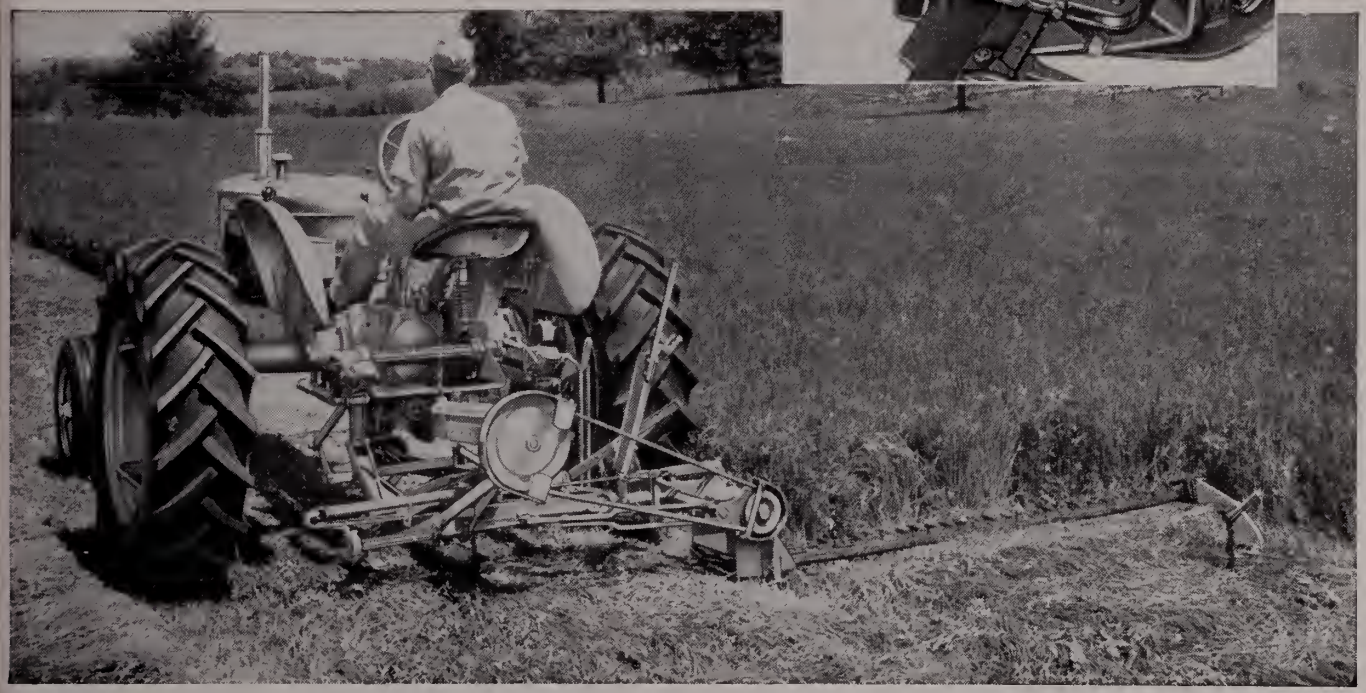
Trained Vocational Agriculture teachers are in great demand and will continue to be so. The turnover of teachers of agriculture in

(Continued on page 32)

TWIN-WHEEL drive eliminates pitman. Heavy twin fly wheels are counter-rotating . . . balance each other and sickle motion.



No. 7 MOWER — faster, easier cutting . . . up to 2800 strokes per minute. Operates equally well at any cutter bar angle. Shown tractor-mounted on WD-45 with SNAP-COUPLER hitch. Pull-type also available for any tractor with standard PTO.



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With characteristic originality, Allis-Chalmers has introduced another great new advance in hay harvesting . . . smooth, quiet rotary action that eliminates forever the destructive vibration always associated with pitman-drive mowers.

Cutter bar is always on same level as drive mechanism and operates smoothly at any angle . . . from vertical to 45 degrees below horizontal. Available rear-mounted for Allis-Chalmers WD-45 Tractor, or in trail-type model for any tractor with standard power take-off.

Here is a mower that brings new vigor, new performance to the age-old task of mowing . . . with design that's years ahead.

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***LISTEN TO** the National Farm and Home Hour every Saturday on your NBC radio station.*

VOC. AG. EC.

(Continued from page 30)

South Carolina high schools is rather high. The demand for fully qualified teachers of agriculture has exceeded the supply since World War II. Many teachers of agriculture have become principals or superintendents. Many others enter the Extension Service, the Soil Conservation Service, and other public agricultural work. Still others engage in agricultural salesmanship and educational work of various types. A graduate of vocational agriculture is qualified to teach sciences in secondary schools as well as vocational agriculture. Many return to farming with a good background in many phases of agriculture.

A survey in 1940 of the first 410 graduates in agricultural education from Clemson College revealed that:

56% were teaching Vocational Agriculture in high schools

21% were engaged in various other fields of agricultural work

6% were teaching in fields other than agriculture

17% were in various business, professional, and miscellaneous occupations including military service.

For boys who like agriculture and like to work with people, there is no other profession that offers the satisfaction, and provides the opportunity for service to rural people than that of a Vocational Agriculture teacher. He is accepted in any community or town, socially and professionally. His job in the community is an important one; through his teaching he is helping mold the future of our state and nation.

Seniors in Agricultural Education get experience in teaching.

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NEW "TC"
TRACTION-CONTROL
FAST-HITCH

PLUS

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TORQUE AMPLIFIER

. . . gives you PULL-POWER second to none!

Say goodbye to frequent shallow-ups and shiftdowns! Here's your *double-barreled* answer to tough spots—new Fast-Hitch with Traction-Control, plus Torque Amplifier! See how this great combination of "grip and go" gives new McCormick® Farmall® 350, 450, and International® 350 Utility tractors pull-power out of all proportion to rated horsepower.

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Call your IH dealer . . . he'll gladly demonstrate. Feel the "grip and go" of traction that grows with the load and the power-punch of TA. Try the new 4-plow Farmall 450 . . . 3-plow Farmall 350, or International 350 Utility.

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Outplow them all with the "grip and go" of this new Farmall 450—pulling a new McCormick 4-furrow Fast-Hitch plow with individual spring trip beams.

NEW PILOT GUIDE

At a glance . . . Pilot Guide tells plowing depth and whether you have the right amount of weight transfer to match soil condition. Try "look-ahead" farming!

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